



STATE OF UTAH  
NATURAL RESOURCES  
Oil, Gas & Mining

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August 7, 1986

TO: Susan Linner, Permit Supervisor  
FROM: Lynn Kunzler, Reclamation Biologist *Lynn*  
RE: Revegetation Sampling for Bond Release, Crystal Mine,  
ACT/045/010, Tooele County, Utah

On July 30, 1986, I conducted a vegetative survey of the revegetation at the Crystal Mine in Tooele County, Utah, for the purpose of determining whether the area had been successfully reclaimed as per the criteria of Rule M-10(12).

Methods:

The entire revegetated area was systematically sampled using 20 transects of 40 meters in length. Along each transect, a 10-pin frame was regularly placed 5 times for a total of 50 pins per transect. Only the first hit on vegetation, litter, rock and bare ground was recorded. Vegetation was recorded by species. Observations of the adjacent, undisturbed area were also made. Several photographs of the mine site and adjacent areas were taken.

Results and Discussion:

Results of sampling (summary attached) showed a total vegetation cover of 20.4%. Of this, 4.4% was "weed" cover and 16% was contributed by species intended for reclamation. Sample adequacy was exceeded at the 90% statistical confidence level.

Observation of surrounding vegetation (no samples taken) indicated a vegetative cover between 25-35%. Only isolated small patches of cheatgrass or other weeds were observed. Using the low end of this range, the 70% success standard of Rule M-10(12) would equal 17.5%.

Analysis of percent cover on individual transects shows a range from 4% to 26% cover (cover by weedy species not included). Six transects had cover less than 10%, three (3) transects had cover equal to the mean, and eleven (11) transects (55%) had cover exceeding the success criteria of 17.5%. This demonstrates that the vegetation is not evenly distributed.

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The approved mine plan indicates that 17.6 acres were to be disturbed. However, there is no map in the file which identifies the total area disturbed, the areas or acreage for which a variance was requested or approved, or the acreage that was revegetated. Without this information, the Division would have to survey the areas of poor revegetation to determine costs to rip, reseed, and mulch the area.

Recommendations:

Since successful revegetation areas were relatively large and identifiable, a partial bond release could be granted. However, before any bond money is released (current bond is only \$17,000), the operator should provide a map (scale 1:1200 or larger) which shows the extent of disturbance, the rock outcrop areas for which a variance was requested, and the area that was revegetated. From this map, the Division could then determine the acreage that would need reworking and could establish a cost for the work. The balance could then be released.

jvb  
Enclosure  
cc: Pam Grubaugh-Littig  
0071R-25

Summary of Vegetation Data  
Collected on July 30, 1986  
Crystal Mine  
ACT/O45/O10

Transect #	1	2	3	4	5	6	7	8	9	10	11	12
Cover*	26	16	6	20	18	16	18	24	18	18	16	10
Weeds	4	4	2	12	2	0	4	0	0	14	2	0
Total Cover	30	20	8	32	20	16	22	24	18	32	18	10
Litter	4	10	6	14	8	16	0	4	12	4	8	2
Bare Ground	16	0	0	18	2	12	24	8	14	4	12	14
Rock**	50	70	86	36	70	56	54	64	56	60	62	74

Transect #	13	14	15	16	17	18	19	20	Mean	S	N <sub>min</sub>
Cover*	20	4	4	4	22	24	26	10	16.0%	3.66	14.1
Weeds	0	4	2	8	8	10	12	0	4.4%		
Total Cover	20	8	6	12	30	34	38	10	20.4%		
Litter	6	12	4	8	12	18	16	0	8.2%		
Bare Ground	4	2	4	6	4	8	0	6	7.9%		
Rock**	70	78	86	74	54	40	46	84	63.5%		

\* % cover of species desirable for reclamation.

\*\* Most rock recordings were small fragments (-2") on the surface.

N<sub>min</sub> was calculated at 90% confidence level using DOGM's standard sample adequacy formula (See Vegetation Information Guidelines).

0071R-27